Amendments to the Claims:

This listing of claims will replace all prior versions and listing of claims in the application:

Listing of Claims:

1. (original) A system for estimating parasitic fuel leakage from a fuel injection system for an internal combustion engine, the parasitic fuel leakage corresponding to a leakage of a fuel from the fuel injection system when no fuel is being supplied to, or drawn from, the fuel injection system, the fuel injection system including a fuel collection unit fluidly coupled to at least one fuel injector associated with the engine, the system comprising:

a pressure sensor producing a pressure signal indicative of fuel pressure within the fuel injection system;

means for determining an engine operating condition; and

a control circuit configured to estimate a quantity of parasitic fuel leakage as a function of the pressure signal and the engine operating condition.

2. (original) The system of claim 1, wherein the pressure sensor is coupled to the fuel collection unit.

3. (original) The system of claim 1, wherein the pressure sensor is coupled to the fuel injector.

4. (original) The system of claim 1, wherein the pressure sensor is coupled a fuel line, the fuel line fluidly coupling the fuel collection unit to the at least one fuel injector.

5. (original) The system of claim 1, wherein the control circuit is further configured to multiply the quantity of parasitic fuel leakage by an engine speed ratio, the engine speed ratio corresponding to a calibration engine speed divided by a measured engine speed of the internal combustion engine.

6. (original) The system of claim 1, wherein the means for determining an engine operating condition includes means for determining an engine temperature.

7. (original) The system of claim 6, further comprising a data storage medium having stored therein a data table mapping values of the pressure signal and the engine temperature to estimated parasitic fuel leakage values;

wherein the control circuit is configured to estimate the quantity of parasitic fuel leakage via the data table.

8. (original) The system of claim 6, wherein the means for determining an engine temperature includes means for determining an engine coolant temperature.

9. (original) The system of claim 6, wherein the means for determining an engine temperature includes means for determining a fuel temperature.

10. (original) The system of claim 9, wherein the means for determining a fuel temperature includes a fuel temperature sensor producing a temperature signal indicative of a fuel temperature of the fuel injection system.

11. (original) The system of claim 10, wherein the control circuit is further configured to determine a change in pressure value based on the pressure signal.

12. (original) The system of claim 11, wherein the control circuit is further configured to determine a bulk modulus value of the fuel and estimate the quantity of parasitic fuel leakage based on the change in pressure value and the bulk modulus value.

13. (original) The system of claim 12, further comprising a data storage medium having stored therein a bulk modulus data table mapping values of the pressure signal and the temperature signal to bulk modulus values of the fuel;

14. (original) The system of claim 12, wherein the control circuit is configured to estimate the quantity of parasitic fuel leakage based on the following equation:

Leakage = (Volume * *Pressure) / Bulk Modulus

wherein *Leakage* is the estimated quantity of parasitic fuel leakage, *Volume* is a value of volume of the fuel injection system, **Pressure* is the change in pressure value, and *Bulk Modulus* is the bulk modulus value of the fuel.

15. (original) The system of claim 1, wherein the means for determining an engine operating condition includes means for determining an engine motoring condition.

16. (original) The system of claim 1, wherein the means for determining an engine motoring condition includes means for determining a no fueling condition.

17. (original) The system of claim 15, wherein the control circuit is further configured to determine a change in pressure value based on the pressure signal.

18. (original) The system of claim 17, wherein the control circuit is further configured to determine a bulk modulus value of the fuel and estimate the quantity of parasitic fuel leakage based on the change in pressure value and the bulk modulus value.

19. (original) The system of claim 18, further comprising a fuel temperature sensor producing a temperature signal indicative of a fuel temperature of the fuel injection system.

20. (original) The system of claim 19, further comprising a data storage medium having stored therein a bulk modulus table mapping values of the pressure signal and the temperature signal to bulk modulus values of the fuel;

wherein the control computer is configured to determine the bulk modulus value of the fuel via the bulk modulus data table.

21. (original) The system of claim 18, wherein the control circuit is configured to estimate the quantity of parasitic fuel leakage based on the following equation:

Leakage = (Volume * *Pressure) / Bulk Modulus

wherein *Leakage* is the estimated quantity of parasitic fuel leakage, *Volume* is a value of volume of the fuel injection system, **Pressure* is the change in pressure value, and *Bulk Modulus* is the bulk modulus value of the fuel.

22. (original) The system of claim 15, further comprising:

a fuel supply having stored therein a quantity of the fuel;

a fuel pump fluidly coupled to the fuel supply and fluidly coupled to the fuel injection system, the fuel pump configured to pump the fuel from the fuel supply to the fuel injection system in response to a trigger signal and to discontinue pumping the fuel to the fuel injection system in response to a stop signal;

wherein the control circuit is configured to produce the stop signal in response to the motoring condition.

23. (original) The system of claim 17, wherein the control circuit is further configured to convert the change in pressure value to a predetermined data format.

24. (original) The system of 23, wherein the predetermined data format includes a change in pressure per crank degree of the internal combustion engine data format.

25. (original) The system of 23, wherein the predetermined data format includes a change in pressure per stroke of the internal combustion engine data format.

26. (original) The system of claim 1, wherein the fluid collection unit includes a fuel accumulator.

27. (original) The system of claim 1, wherein the fuel collection unit includes a fuel rail.

28. (original) The system of claim 1, wherein the control circuit is further configured to produce a fault value if the estimated quantity of parasitic fuel leakage is greater than a threshold value.

29. (original) The system of claim 1, wherein the control circuit is further configured to alert an operator of the internal combustion engine if the estimated quantity of parasitic fuel leakage is greater than a threshold value.

30. (currently amended) A method for estimating a quantity of parasitic fuel leakage from a fuel injection system for an internal combustion engine, the parasitic fuel leakage corresponding to a leakage of a fuel from the fuel injection system when no fuel

is being supplied to, or drawn from, the fuel injection system, the fuel injection system including a fuel collection unit fluidly coupled to at least one fuel injector associated with the engine, the method comprising the steps of:

hydraulically locking the fuel injection system;

determining a pressure value indicative of fuel pressure within the fuel injection system when the fuel injection system is hydraulically locked;

determining an engine operating condition when the fuel injection system is hydraulically locked; and

estimating the quantity of parasitic fuel leakage as a function of the engine operating condition and the pressure value.

31. (original) The method of claim 30, wherein hydraulically locking the fuel injection system includes discontinuing supplying fuel to and drawing fuel from the fuel injection system.

32. (original) The method of claim 30, wherein hydraulically locking the fuel injection system includes disabling the operation of a fuel pump.

33. (original) The method of claim 30, wherein determining a pressure value includes receiving a pressure signal from a pressure sensor coupled to the fuel collection unit.

34. (original) The method of claim 30, wherein determining a pressure value includes receiving a pressure signal from a pressure sensor coupled to the at least one fuel injector.

35. (original) The method of claim 30, wherein determining a pressure value includes receiving a pressure signal from a pressure sensor coupled to a fuel line fluidly coupled to the fuel collection unit and the at least one fuel injector.

36. (original) The method of claim 30, further comprising the step of multiplying the quantity of parasitic fuel leakage by an engine speed ratio corresponding to a calibration engine speed divided by a measured engine speed of the internal combustion engine.

37. (original) The method of claim 30, wherein determining an engine operating condition includes determining an engine temperature.

38. (original) The method of claim 37, wherein estimating the quantity of parasitic fuel leakage includes retrieving the quantity of parasitic fuel leakage from a data table stored in a data storage medium, the retrieving step being based on values of the pressure signal and the engine temperature.

39. (original) The method of claim 37, wherein determining an engine temperature includes determining an engine coolant temperature.

40. (original) The method of claim 37, wherein determining an engine temperature includes determining a fuel temperature.

41. (original) The method of claim 40, wherein determining a fuel temperature includes receiving a temperature signal indicative of a fuel temperature of the fuel from a fuel temperature sensor.

42. (original) The method of claim 41, further comprising the step of determining a change in pressure value based on the pressure value.

43. (original) The method of claim 42, further comprising the step of determining a bulk modulus value of the fuel, wherein estimating the quantity of parasitic fuel leakage includes estimating the quantity of parasitic fuel leakage based on the change in pressure value and the bulk modulus value.

44. (original) The method of claim 43, wherein determining a bulk modulus value of the fuel includes determining the bulk modulus value of the fuel based on the pressure value and the temperature signal.

45. (original) The method of claim 43, wherein estimating the quantity of parasitic fuel leakage includes estimating the quantity of parasitic fuel leakage based on the following equation:

Leakage = (Volume * *Pressure) / Bulk Modulus

wherein *Leakage* is the estimated quantity of parasitic fuel leakage, *Volume* is a value of volume of the fuel injection system, **Pressure* is the change in pressure value, and *Bulk Modulus* is the bulk modulus value of the fuel.

46. (original) The method of claim 30, wherein determining an engine operating condition includes determining an engine motoring condition.

47. (original) The method of claim 46, further comprising the step of determining a change in pressure value based on the pressure value.

48. (original) The method of claim 47, wherein determining a change in pressure value based on the pressure value includes monitoring the pressure value over a period of time.

49. (original) The method of claim 47, further comprising the step of determining a bulk modulus value of the fuel, wherein estimating the quantity of parasitic fuel leakage includes estimating the quantity of parasitic fuel leakage based on the change in pressure value and the bulk modulus value.

50. (original) The method of claim 49, further comprising the step of determining a temperature value of the fuel.

51. (original) The method of claim 50, wherein determining the bulk modulus value of the fuel includes determining the bulk modulus value of the fuel based on the pressure value and the temperature value.

52. (original) The method of claim 50, further comprising the step of storing a bulk modulus data table having a first input corresponding to a value of fuel pressure, a second input corresponding to a value of fuel temperature, and an output corresponding to a bulk modulus value in a data storage medium.

53. (original) The method of claim 52, wherein determining the bulk modulus of the fuel includes retrieving a bulk modulus value of the fuel from the bulk modulus data table based on the pressure value and the temperature value.

54. (original) The method of claim 49, wherein estimating the quantity of parasitic fuel leakage includes estimating the quantity of parasitic fuel leakage based on the following equation:

*Leakage = (Volume * *Pressure) / Bulk Modulus*

wherein *Leakage* is the estimated quantity of parasitic fuel leakage, *Volume* is a value of volume of the fuel injection system, **Pressure* is the change in pressure value, and *Bulk Modulus* is the bulk modulus value of the fuel.

55. (original) The method of claim 30, further comprising the step of converting the change in pressure value to a predetermined data format.

56. (original) The method of claim 55, wherein converting the change in pressure value to a predetermined data format includes converting the change in pressure value to a change in pressure per crank degree of the internal combustion engine data value.

57. (original) The method of claim 55, wherein converting the change in pressure value to a predetermined data format includes converting the change in pressure value to a change in pressure per stroke of the internal combustion engine data format.

58. (original) The method of claim 30, further comprising the step of comparing the quantity of parasitic fuel leakage to a threshold value.

59. (original) The method of claim 58, further comprising the step of producing a fault value if the quantity of parasitic fuel leakage is greater than the threshold value.

60. (original) The method of claim 58, further comprising alerting an operator of a motor vehicle if the quantity of parasitic fuel leakage is greater than the threshold value.

61. (original) A method for estimating a quantity of parasitic fuel leakage from a fuel injection system for an internal combustion engine, the parasitic fuel leakage

corresponding to a leakage of a fuel from the fuel injection system when no fuel is being supplied to, or drawn from, the fuel injection system, the fuel injection system including a fuel collection unit fluidly coupled to at least one fuel injector associated with the engine, the method comprising the steps of:

determining an engine motoring condition of the internal combustion engine;

discontinuing supplying fuel to and drawing fuel from the fuel injection system in response to the operating condition;

determining a temperature value of the fuel;

determining a pressure value of the fuel injection system;

determining a change in pressure value of the fuel injection system based on the pressure value;

determining a bulk modulus value of the fuel based on the temperature value and the pressure value; and

estimating the quantity of parasitic fuel leakage based on the change in pressure value and the bulk modulus value.